

(PCT Article 36 and Rule 70)

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/CH2004/000231

Box No. I

Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3 and 23.1(b))
- ☐ publication of the international application (Rule 12.4)
- ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1, 2, 4-24 \_\_\_\_\_ as originally filed/furnished
- pages\* 3, 3a \_\_\_\_\_ received by this Authority on 10.12.2004 with letter of 10.12.2004
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the claims:
- nos. \_\_\_\_\_ as originally filed/furnished
- nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19
- nos.\* 1-13 \_\_\_\_\_ received by this Authority on 10.12.2004 with letter of 10.12.2004
- nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the drawings:
- sheets 1/4-4/4 \_\_\_\_\_ as originally filed/furnished
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

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Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1. Statement			
Novelty (N)	Claims	1-13	YES
	Claims		NO
Inventive step (IS)	Claims	1-13	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-13	YES
	Claims		NO
2. Citations and explanations (Rule 70.7)			
This report makes reference to the following documents:			
D1: US A 4542013			
D2: JP A 7117327			
D3: JP B 48030462			
D4: JP A 5245138			
1. The amendments submitted with the letter of 10 December 2004 (claims 1-13 and pages 3, 3a of the description) do not introduce substantive matter which goes beyond the original disclosure in the international application as filed, and do not contravene PCT Article 34(2)(b).			
2. The subject matter of claims 1-13 is novel (PCT Article 33(2)).			
2.1 D1 describes polyvinylalcohol gels and articles produced therefrom, the aqueous solution containing a mixture of at least two polyvinylalcohols with different polymerisation degrees and hydrolysed to different degrees (search report).			

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

The ranges of polymerisation degree disclosed in D1 are similar to those in the present claims, and the PVA with a lower polymerisation degree is hydrolysed to a different degree (<90%), unlike the present claim 1.

Consequently, the subject matter of claims 1-13 is novel over D1.

2.2 D2 describes polyvinylalcohol gels and articles produced therefrom, the aqueous solution containing a mixture of at least two polyvinylalcohols with different polymerisation degrees and a hydrolysis degree ranging from 65% to 95% (search report).

The ranges of polymerisation degrees disclosed in D2 do not correspond to those in the present claims.

Consequently, the subject matter of claims 1-13 is novel over D2.

2.3 D3 and D4 describe polyvinylalcohol gels with a low polymerisation degree (search report).

D3 and D4 do not disclose a mixture of at least two PVA with different polymerisation degrees.

Consequently, the subject matter of claims 1-13 is novel over D3 and D4.

3. The present application meets the requirements of PCT Article 33(1) because the subject matter of claims 1-13 involves an inventive step (PCT Article 33(3)). The

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reasons therefor have been explained in the applicant's letter of 10 December 2004.

Document D1 is regarded as the prior art closest to the subject matter of claims 1-13 and discloses a mixture of at least two polyvinylalcohols with different polymerisation degrees and a high hydrolysis degree in an aqueous solution (2.1 above).

The subject matter of claims 1-13 therefore differs from D1 in that the PVA component has defined polymerisation degrees and at the same time a hydrolysis degree of more than 95%.

The examples and the description of the present application show that the use of at least two PVA having the claimed polymerisation degree and a hydrolysis degree of more than 95% leads to an increase in mechanical strength and modulus of elasticity (as explained by the applicant in the letter of 10 December 2004). The present invention can therefore be considered to address the problem of producing polyvinylalcohol gels with increased strength and modulus of elasticity.

The solution proposed in claims 1-13 of the present application can be considered inventive (PCT Article 33(3)) for the following reasons.

None of the documents D1-D4 discloses or suggests the use of at least two PVA with the claimed polymerisation and hydrolysis degrees in order to improve mechanical properties (i.e. increased strength and modulus of

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Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
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elasticity) of polyvinylalcohol gels.

In D2, the hydrolysis degree of the PVA component is lower than that in the present application.

In D3 and D4, the PVA with a low polymerisation degree possess good mechanical properties (such as flexibility in D3), but no mixture of at least two PVA is described, as claimed in the present application.

Consequently, the subject matter of claims 1-13 is inventive in relation to D1-D4.

**Box No. VIII** Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

The application fails to meet the requirements of PCT Article 6 for the following reasons.

1. Claims 2 and 9 do not meet the requirements of PCT Article 6 because the subject matter for which protection is sought is not clearly defined. These claims attempt to define their subject matter in terms of the result to be achieved, and in doing so merely state the problem addressed, without indicating the technical features necessary to achieve this result.

2. The term "transparent" in claim 11 is unclear and does not correspond to a clearly defined range (percentage) of this property.

3. Neither the claims nor the description indicate the process by and/or conditions in which the modulus of elasticity, strength, viscosity, polymerisation degree, number of chain branches, hydrolysis degree, swelling degree and transparency are measured.

4. Claims 3 and 4 describe the products according to the application in terms of their production process. However, these process features do not restrict the scope of protection of product claims and lead to a lack of clarity.

5. The expressions "preferably, respectively, in particular, preferred, most preferred" do not restrict the claims (claims 2 and 7-10).

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Box No. VIII      Certain observations on the international application

6. In the description, the examples and comparative examples according to the invention should be identified.